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ABSTRACT

This study investigated the teaching and learning behaviors of elementary school teachers and students, ascertaining student teachers' ratings of the observed behavior and comparing student teachers' and elementary teachers' ratings of behavior. A total of 84 elementary teachers and 25 third-year science education majors from Taiwan participated in the study. The study found that both student teachers and elementary teachers considered teacher performance more important than classroom management. However, student teachers considered student discipline most important among a range of teacher skills, whereas elementary teachers considered student ability most important and student discipline least important. The study also found that the average wait time between utterance in teacher-student exchanges ranged from 1.18 to 4.58 seconds, with second-grade math teachers giving the shortest wait time and fifth-grade social science teachers giving the longest wait time. (Contains 20 references.) (MDM)

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# A Study of the Classroom Behavior of Elementary School Teachers and Students

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Abstract

The purpose of this study is to: (1) investigate the teaching and learning behavior of elementary school teachers and students, (2) understand student teachers' ratings of the observed behavior, (3) compare student teachers' and elementary school teachers' ratings of behavior. Participants in this study were 25 juniors majoring in Science Education at National Pingtung Teachers College and 84 elementary school teachers. Two questionnaires were used during the observation of teacher and student behavior. The main findings were:

1. Student teachers' and elementary school teachers' ratings of observed teacher behavior were not the same. Although both considered "Teacher Performance" more important than "Classroom Management", student teachers considered "Student Discipline" most important while elementary school teachers considered "Student Ability" most important and "Student Discipline" least important.

2. Teachers' average wait-time ranged from 1.18 to 4.58 seconds. Second grade math teachers gave the shortest wait-time while fifth grade Social Science teachers gave the longest wait-time. Second grade teachers waited an average of 2.69 seconds while fifth grade teachers waited an average of 2.97 seconds for students to respond.

3. Most questions asked by teachers were relatively easy, low-level cognitive questions, especially in Mathematics.

# A Study of the Classroom Behavior of Elementary School Teachers and Students

Teacher behavior includes teaching method, style, technique and classroom management. Rosenshine (1971) reviewed 50 studies related to teacher behavior and found that it is related to students' academic achievement. He found that effective teachers express themselves clearly; are flexible, enthusiastic, and task-oriented; use positive criticism; are non-directive; and provide students chances to learn. Tobin and Fraser (1990) indicated that outstanding natural science teachers have good disciplinary strategies to facilitate and maintain students' participation in learning; use strategies to improve students' understanding of science; encourage students' participation in activities; and maintain an optimal learning atmosphere.

In the Republic of China (R.O.C.), educators have begun to pay attention to how student teachers improve their teaching through classroom observation. However, very few studies have been done in this field. This study hopes to add to our understanding of teacher and student behavior in the R.O.C. and to provide student teachers with a chance to observe teacher student interaction.

Classroom Observation. The classroom is the place where teachers and students interact with each other. Good interaction between teachers and students can help students reach the goals of studying.

Eash and Rasher (1977) noted that teachers can improve their teaching through classroom observation. It can help teachers learn how to cope with students' problems and to improve their teaching behavior. Good and Brophy (1974) discovered that many teachers do not know what kind of teacher behavior resulted in student improvement.

Question Type. Hamilton and Brady (1991) found that middle school social studies and science teachers asked more direct than open-ended or clarifying questions. Riley (1986) investigated 26 pre-service teachers teaching science to 129 students in Grades 2 to 5. Results suggest that for achievement of comprehension level objectives, a combination of low and high cognitive level questions with long wait-time appears effective; for achievement of knowledge level objectives, low-level questions with medium wait-time are effective.

Wait-time. Wait-time is the duration of pauses separating utterances during teacher-student verbal exchange. Researchers study wait-time to investigate its effect on learning. Rowe (1969) found that elementary science teachers, on the average, gave less than three seconds wait-time to students; in most cases, teachers gave less than one second wait-time. Fagan, Hassler, and Szabo (1981) and Tobin (1986) later found results consistent with Rowe's.

Rowe (1974, 1987) and Tobin and Capie (1982) found that extending wait-time to more than three seconds enhanced students' achievement and teacher-student interaction. Tobin and Capie

(1982) found that middle school achievement may be increased by using a mean teacher wait-time of approximately three seconds and ensuring that students are maximally engaged in the instructional objectives.

Tobin (1980) found that in Australia, the longer the wait-time junior high school teachers gave to their students, the higher their students' achievement. Tobin (1986) found that Australian elementary school teachers's average wait-time ranged from .4 seconds to 3.6 seconds depending on the subject. Tobin (1987) reviewed wait-time studies conducted before 1987. He found that when given more than three seconds wait-time, junior high school students' science achievement improved. Furthermore, Tobin (1986) found that in Grades 6 and 7, teachers' use of an average wait-time of 3-5 seconds was associated with higher mathematics achievement and improvements in the quality of teacher and student discourse.

Results of studies indicate a relationship between wait-time and the cognitive level of questioning (Fagan, Hassler, & Szabo, 1981; Swift & Gooding, 1993). Samson, Strykowski, Weinstein, and Walberg (1987) indicated that higher cognitive questioning strategies were found to have a small positive effect on learning measures but not as large as has been suggested by the previous meta-analysis by Redfield and Rousseau.

In the R.O.C., Zhang (1983) investigated 24 third grade elementary school teachers. He found that in Chinese class, 88.57% of teachers' questions required memorized responses and the average

wait-time they gave to students was 1.74 seconds.

## Method

### Participants

Participants in this study were 25 National Pingtung Teachers College juniors majoring in Science Education and 84 elementary school teachers in the R.O.C.

### Measures

Classroom Observation Questionnaire. For the purpose of this study, the researcher reviewed the related literature, adapted the 22 teaching principles presented by Anderson, Evertson, and Brophy (1979) and, taking into consideration Chinese culture, developed the Classroom Observation Questionnaire, including a Teacher Form (37 items) and a Student Form (24 items). Both the Teacher Form and the Student Form were updated after each implementation through discussion among the observers and the researcher. The final version of the Classroom Observation Questionnaire, Teacher Form consists of 65 items. There are three subscales: Teaching Method and Skill (31 items), Teacher Performance (26 items), and Classroom Management (8 items). The final version of the Student Form consists of 58 items. There are three subscales: Student Discipline (29 items), Student Performance (20 items), and Student Ability (9 items).

Teacher Questioning and Wait-Time Recording Sheet. On the Teacher Questioning and Wait-Time Recording Sheet, respondents were required to record questions and evaluate the cognitive level of

questioning (open-ended questions were considered high cognitive level questions; closed questions were considered low cognitive level questions), the degree of difficulty of questions (easy, medium, and difficult), and the wait-time teachers provided to students.

Procedures

The data was collected in two phases. The first phase was conducted at one elementary school located in Pingtung city from September 1992 to January 1993. Twenty-five observers were divided into twelve groups. Each group observed one class in either the third or fourth grade for a total of five weeks. Before each observation, the observers and the researcher got together to review the rules of observation. Then each group observed one classroom for two class periods. During observation, they completed both the Teacher Form and the Student Form of the Classroom Observation Questionnaire. Each group observed a class a total of five times during the first round of observation. Those who observed the third grade then switched to observe fifth grade classes for a total of four times (one time less than the first round of observation due to a school holiday). Those who observed the fourth grade then switched to observe the second grade. In the second round of observation, in addition to completing the Teacher Form and Student Form of the Classroom Observation Questionnaire, observers also filled out the Teacher Questioning and Wait-Time Recording Sheet. After each observation, discussions were

conducted by the researcher which focused on sharing what was observed and on exchanging ideas in regard to updating the Classroom Observation Questionnaire.

After observing nine times, observers sorted the responses from the final version of the Teacher Form and Student Form of the Classroom Observation Questionnaire using standardized instructions in the Q-sort format. The results of the Q-sort were then provided to the observers for discussion.

The second phase of data collection was conducted in August, 1993. Eighty-four elementary school teachers sorted the responses from the Teacher Form and Student Form of the Classroom Observation Questionnaire, using the same Q-sort format.

The results of the elementary school teachers' Q-sort were also provided to the 25 student teachers for comparison with their own Q-sort results.

## Results

One of the purposes of this study was to help student teachers to explore teachers' and students' classroom behavior. Each group observed two classes, one class five times and the other class four times, and through discussion updated the Classroom Observation Questionnaire after each observation. The Teacher Form of the Classroom Observation Questionnaire was revised from the original 37 items into 65 items making it more comprehensive. The Student Form was revised from the original 24 items into 58 items. The results of this revision indicated that the observations and

'discussions helped student teachers to explore the classroom behavior of teachers and students.

Results of the Q-sort indicated that in the Teacher Form of the Classroom Observation Questionnaire, the ratings of student teachers and elementary school teachers differed by less than fifteen points on 42 of the items, while on eight items there was a difference of more than thirty points.

In the Student Form, the ratings of student teachers and elementary school teachers differed by less than fifteen points on 29 of the items, while on 13 items there was a difference of more than thirty points.

The above results suggest that the points of view of student teachers and elementary school teachers differed more on the Student Form than on the Teacher Form.

Both student teachers and elementary school teachers rated the nine items of Teacher Performance, five items of Teaching Methods and Skills, and one item of Classroom Management as the fifteen most important items. However, they had different points of view concerning the importance of Student Discipline, Student Performance, and Student Ability (see Table 1).

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Insert Table 1 about here

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Table 1 indicates that both student teachers and elementary

school teachers in general thought that "Teacher Performance" was more important, and the "Classroom Management" was less important. Student teachers thought that "Student Discipline" was more important while elementary school teachers thought that "Student Discipline" was less important and "Student Performance" was more important.

The results of the Q-sort showed that on the Teacher Form, six items were rated in the range of the most important 15 items by both student teachers and elementary school teachers while seven items fell into the range of the least important 15 items. The results indicate that student teachers and elementary school teachers have some different opinions about the importance of teacher behavior. Part of the reason might be due to the fact that experienced teachers and student teachers pay attention to different things. For example, teachers pay more attention to Teaching Performance while student teachers pay more attention to Teaching Methods and Skills.

The results of the Q-sort showed that in the Student Form, four items were rated in the range of the most important 15 items by both student teachers and elementary school teachers and four items fell into the range of the least important 15 items. The results indicate that student teachers and elementary school teachers have more difference in opinion concerning the importance of student behavior than concerning teacher behavior. A possible reason may be that student teachers pay more attention to student

discipline while most teachers have experience in classroom management and therefore pay more attention to student performance.

Most questions asked by elementary school teachers in this study were low cognitive level/closed questions, accounting for 72.8% of all questions. Fifth grade teachers asked even more low cognitive level questions--81.9%. All questions asked by second grade teachers in Mathematics classes were closed questions (see Table 2).

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Insert Table 2 about here

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## Discussion

Most elementary teachers in this study asked predominately low cognitive level/closed questions. Is it easier to ask closed questions, and are closed questions easier for students to answer? Further investigation is needed. Fifth grade Social Science teachers gave the longest wait-time among the teachers. Whether their use of small group discussion resulted in more open-ended questions also needs further investigation. The average wait-time given by second grade teachers was 2.69 while fifth grade teachers gave 2.97 seconds. This under-three-seconds average wait-time is consistent with other research findings in the U.S. and the R.O.C. Training is needed to help elementary school teachers in the R.O.C. to extend their wait-time.

Teachers asked more open-ended questions (high cognitive level) and also gave more wait-time in subjects such as Social Science, Chinese, and Natural Science. All questions asked by second grade Mathematics teachers were closed questions and the average wait-time they gave was 1.18 seconds. The relationship between wait-time and the cognitive level of questions asked by teachers deserves further study.

## Conclusions

This study is an application and extension of process-product research. The main findings of this study are:

1. Student teachers and elementary school teachers' ratings on the Student Form and Teacher Form were not the same. Student teachers considered "Student Discipline" most important, while elementary school teachers considered "Student Ability" most important.

2. Most questions asked by observed teachers were relatively easy, low-level cognitive questions, accounting for 72.8% of all questions. Fifth grade teachers asked even more low cognitive level questions--81.9%. All questions asked by second grade teachers in Mathematics classes were closed questions.

3. Teachers asked more open-ended questions (high cognitive level) and also gave more wait-time in subjects such as Social Science, Chinese, and Natural Science.

4. Teachers' average wait-time ranged from 1.18 to 4.58 seconds. Second grade teachers waited an average of 2.69 seconds

while fifth grade teachers waited an average of 2.97 seconds for students to respond.

5. Second grade Math teachers gave the shortest wait-time while fifth grade Social Science teachers gave the longest wait-time.

The results of this study indicate that fifth grade Social Science teachers gave the longest wait-time among all teachers. Future studies need to explore to what extent fifth grade Social Science classes focus on thinking; to what extent second grade classes emphasize factual memory; and to what extent other factors such as teachers' beliefs and teaching styles affect wait-time given to students.

Limitations of the Study

There are several limitations of this study. First, although the methods used in this study include quantitative and qualitative study approaches, due to financial consideration and the particular purpose of this study, the qualitative portion of the study does not use a "typical" qualitative approach using ethnography to analyze and report the results of observation in detail. In addition, "macro" aspects such as classroom environmental factors; teaching methods; the arrangement of tables; and subculture of the class are beyond the concern of this study, although all of them affect teachers' and students' classroom behavior.

Second, studies of this type in the R.O.C. are still in the stage of infancy; this study is defined as a descriptive and

correlative study.

Third, although groups of two or three persons observed two different classes during different phases of the study, cross validation was not conducted because the Classroom Observation Questionnaire was constantly in the process of being updated. It was therefore impossible to compare and contrast the different grades observed by the same group of subjects.

Recommendations

The recommendations of this study for improving elementary school teaching include:

1. Teacher educators should provide a chance for student teachers to observe teachers' and students' classroom behavior. Systematic observation might be helpful. Spending more time observing different teachers teaching different subjects provides student teachers with a bigger picture of teachers' and students' classroom behavior.

2. Teachers should update their teaching and classroom management skills in order to provide a more effective learning environment.

3. Teachers should be more sensitive to the impact of their behavior on students, adjusting their teaching behavior to promote students' learning.

4. Teachers should ask more high cognitive level questions in order to stimulate students to think, to analyze, to organize and to integrate ideas.

5. Teachers should extend wait-time, providing lower ability students enough time to think and to respond.

Recommendations for future research:

1. Longitudinal studies using bigger sample sizes to explore effective teaching strategies and the effects of teachers' and students' behavior on teaching.

2. Investigation of the relationships among questioning, wait-time, and student achievement; in-depth study of how to adequately use questioning and wait-time to promote better teaching.

3. The Classroom Observation Questionnaire developed in this study could be used by both researchers and student teachers to study and observe teacher and student classroom behavior.

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Table 1

Student Teachers and Elementary School Teachers' Rating of the First 15 Important Items of Teacher Form and Student Form

| | Most Important 15 Items | | Less Important 15 Items | |
|---|---|---|---|---|
| | # of Items<br>% | | # of Items<br>% | |
| Subscales (# of Items) | Students | Teachers | Students | Teachers |
| Teaching Methods Methods and Skills (31) | 5<br>16.0 | 5<br>16.0 | 9<br>29.0 | 7<br>22.6 |
| Teacher Performance (26) | 9<br>34.6 | 9<br>34.6 | 3<br>11.5 | 3<br>11.2 |
| Classroom Management (8) | 1<br>12.5 | 1<br>12.5 | 4<br>50.0 | 5<br>62.5 |
| Student Discipline (29) | 11<br>37.9 | 5<br>17.2 | 6<br>20.7 | 12<br>41.4 |
| Student Performance (20) | 1<br>5.0 | 5<br>25.0 | 6<br>30.0 | 2<br>10.0 |
| Student Ability (9) | 3<br>33.3 | 5<br>55.5 | 3<br>33.3 | 1<br>11.1 |

Table 2

The Results of Questioning and Wait-Time

| Grade | | Closed Question % | Open-ended Question % | Easy % | Medium % | Difficult % | Wait Time Second |
|---|---|---|---|---|---|---|---|
| 2 | Chinese | 55.6 | 44.4 | 70.1 | 25.2 | 4.7 | 2.79 |
| 2 | Math | 100.0 | 0 | 100.0 | 0 | 0 | 1.18 |
| 2 | Natural Science | 71.1 | 28.9 | 53.9 | 32.8 | 13.3 | 3.28 |
| 2 | Subtotal | 64.2 | 35.8 | 67.3 | 25.6 | 7.1 | 2.69 |
| 5 | Chinese | 76.4 | 23.6 | 65.4 | 32.3 | 2.3 | 2.85 |
| 5 | Math | 91.6 | 8.4 | 64.7 | 25.7 | 9.6 | 2.53 |
| 5 | Natural Science | 71.8 | 28.2 | 46.2 | 38.5 | 15.3 | 4.03 |
| 5 | Social Science | 60.7 | 39.3 | 67.9 | 25.0 | 7.1 | 4.58 |
| 5 | Music | 88.9 | 11.1 | 77.8 | 22.2 | 0 | 3.09 |
| 5 | Subtotal | 81.9 | 18.1 | 63.5 | 29.2 | 7.3 | 2.97 |
| Total | | 72.8 | 27.2 | 65.4 | 27.4 | 7.2 | 2.82 |